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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,416	04/17/2006	Christian Herlt	HERL0101PUSA	9015
22045	7590	10/12/2011	EXAMINER	
BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075			LAUX, DAVID J	
			ART UNIT	PAPER NUMBER
			3743	
			MAIL DATE	DELIVERY MODE
			10/12/2011	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/595,416

Applicant(s)

HERLT, CHRISTIAN

Examiner

DAVID J. LAUX

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 5) ☒ Claim(s) 1-14 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1-14 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

### **DETAILED ACTION**

This action is in response to applicant's submission dated 09/23/2011. Claim(s) 1-14 is/are pending.

#### ***Response to Arguments***

1. Applicant's arguments filed 09/23/2011 have been fully considered but they are not persuasive.
2. Applicant first argues that '909 fails to disclose the capability to burn an entire bale of straw at one time. However, '909 discloses that the grate diameter (and accordingly, the inlet diameter) is 13 feet and the reactor is shown as having a much greater height (Fig. 1; Col. 4, lines 11-13). A typical small bale of hay is 2 feet by 2 feet by 4 feet. As such, the reactor of '909 is capable of burning an entire bale of hay.
3. Applicant also argues that a bale of hay is not a fluffy fuel of low bulk density because the bale is compressed. Even in its compressed state, however, the bale has a lower bulk density than the equivalent amount of wood, which is the preferred fuel of the reactor of '909.
4. Applicant further argues that the reactor of '909 would not be capable of burning straw because the ash would melt to slag which would accumulate in a hard mass on the grate and prevent the apparatus from working correctly. However, applicant has not claimed any aspect of his invention which would prevent the straw ash from melting into slag. As such, it is unclear how the reactor of applicant's invention would produce straw ash and the reactor of '909 would produce straw slag.

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5. Applicant next argues that '909 would not be capable of burning an entire bale of straw because fuel is added continuously. However, '909 discloses a valve on the fuel inlet which allows fuel to be added and then stopped; if fuel were continuously added, a valve would not be necessary.

6. Applicant concludes by reasserting previous arguments that '909 would not be modified to gasify straw because of the lower melting point of the fuel. However, as combined with '806, one having ordinary skill in the art would be motivated to gasify other types of biomass, such as straw, to recover energy and would use known methods used in other straw gasifiers to modify the gasifier of '909 to be capable of burning straw.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-2, 4, 6, 8, 10 & 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,498,909 to Milner et al in view of US 5,901,653 to Jennebach et al, further in view of US 5,720,165 to Rizzie et al and further in view of US 7,228,806 to Dueck et al.

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9. '909 discloses a gasification boiler for solid fuels, the boiler comprising: a fuel and gasification chamber (20) closable by a filling door (35) (Col. 3, lines 1-5) and having air feeds (43) and depressions (32 in Fig. 1) for collecting and holding ash (Col. 5, lines 10-14), the depressions (32 in Fig. 1) disposed adjacent to a grating (26) arranged at the bottom of the fuel and gasification chamber (20) and configured to allow coarse ash particles to completely combust and not enter a flow of combustion gas (Fig. 1; Col. 5, lines 4-10; ash is allowed to collect in the depressions and any combustible material remaining in the ash would continue to combust and the upper layers of fuel material would prevent the ash from entering the combustion gas flow; the ash is removed from the boiler after being in the gasification chamber, so it would be inferred by one having ordinary skill in the art that the ash has been completely combusted since removing partially combusted ash would be wasteful and reduce the efficiency of the device).

10. '909 fails to disclose a combustion chamber situated below the grating and configured to receive and combust the combustion gas; a secondary combustion chamber connected to an outlet of the combustion chamber configured to further receive and combust the combustion gas; or a heat exchanger. '653 teaches a combustion chamber (35) situated below a grating (26) and configured to receive and combust the combustion gas (Fig. 1; Col. 6, lines 9-18); a secondary combustion chamber (36) connected to an outlet of the combustion chamber (35) configured to further receive and combust the combustion gas (Fig. 1; Col. 6, lines 18-22, 35-37); and a heat exchanger (Col. 7, lines 2-6). It would have been obvious for one skilled in the

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art at the time of invention to combine the gasifier of '909 with the syn-gas combustion chambers of '653 because such a combination would have produced the added benefit of a means for recovering energy from the syn-gas produced by the gasifier of '900 while reducing pollution by using a multi-stage combustion process.

11. '909 also fails to disclose a cylindrical ash separator for collecting ash particles located downstream from the secondary combustion chamber and having an inlet connected at the top tangentially to an outlet of the secondary combustion chamber, the ash separator having an outlet being connected to a heat exchanger. '165 teaches a cylindrical ash separator (16) for collecting ash particles located downstream from a combustion chamber (122) (Fig. 1) and having an inlet connected at the top tangentially to an outlet of the combustion chamber (122) (Fig. 1), the ash separator (16) having an outlet (110) being connected to a heat exchanger (19) (Fig. 1; Col. 7, lines 6-8; applicant has also previously admitted that using heat exchangers to recover energy from exhaust gases is well-known). It would have been obvious for one skilled in the art at the time of invention to combine the gasifier of '909 with the ash separator of '165 because such a combination would have produced the added benefit of a means for reducing particulate matter in the exhaust gas to reduce particulate pollution when the gas is exhausted into the environment.

12. '909 fails to explicitly disclose the gasification boiler burning bales of straw, the gasification chamber configured to receive a bale of straw, although '909 does disclose generally that solid biomass is burned. '806 explicitly states that almost all kinds of biomass, including straw, can be gasified and burned (Col. 1, lines 28-32).

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Furthermore, it is well-known that straw is typically transported and stored in the form of bales. It would have been obvious to one having ordinary skill in the art at the time of invention to combine the biomass gasification reactor of '909 with the straw fuel of '806 because such a combination would have produced the added benefit of a means for recovering energy from straw. Furthermore, the reactor of '909 is presently capable of burning entire bales of straw since the reactor has dimensions far greater than that of a typical bale of straw.

13. With regard to claim 2, '909 further discloses the depressions (32 in Fig. 1) of the fuel and gasification chamber (20) are of half-shell-shaped design (Fig.2) and run parallel to the combustion chamber (20) (Figs. 1 & 2) and each depression (32 in Fig. 1) has a small door for the removal of ash (Col. 5, lines 10-16; double-valve is equivalent to a small door).

14. With regard to claim 4, '909 as combined with '165 further discloses a substantially vertical pipe (184) is arranged centrally within the ash separator (16) (Figs. 1, 4 & 6), the pipe (184) having a lower opening (116). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the lower opening of the pipe approximately halfway up a height of the ash separator (16) (Fig. 6), since shifting the location of parts of a device involves only routine skill in the art.

15. With regard to claims 6, 10 & 12, '909 as combined with '653 and '165 discloses the claimed invention except for the secondary combustion chamber, the ash separator and the heat exchanger being connected in a framework to form a unitary structure. It would have been obvious at the time the invention was made to connect the secondary

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combustion chamber, the ash separator and the heat exchanger in a framework to form a unitary structure, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

16. With regard to claim 8, '909 as combined with '165 further discloses a substantially vertical pipe (184) is arranged centrally within the ash separator (16) (Figs. 1, 4 & 6), the pipe (184) having a lower opening (116) approximately halfway up a height of the ash separator (16) (Fig. 6).

17. With regard to claims 10 & 12, '909 as combined with '653 and '165 discloses the claimed invention except for the secondary combustion chamber, the ash separator and the heat exchanger being connected in a framework to form a constructional unit. It would have been obvious at the time the invention was made to connect the secondary combustion chamber, the ash separator and the heat exchanger in a framework to form a constructional unit, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

18. Claims 3, 5, 7, 9, 11 & 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over '909 in view of '653, '165 and '806 as applied to claims 1, 3 & 5 above, and further in view of US 6,758,149 to Oiwa et al.

19. With regard to claims 3 & 7, '909 as previously combined with '653 further discloses the secondary combustion chamber ('653: 36) is cylindrical and connected at the bottom tangentially to the outlet of the combustion chamber ('653: 35) ('653: Fig. 3;



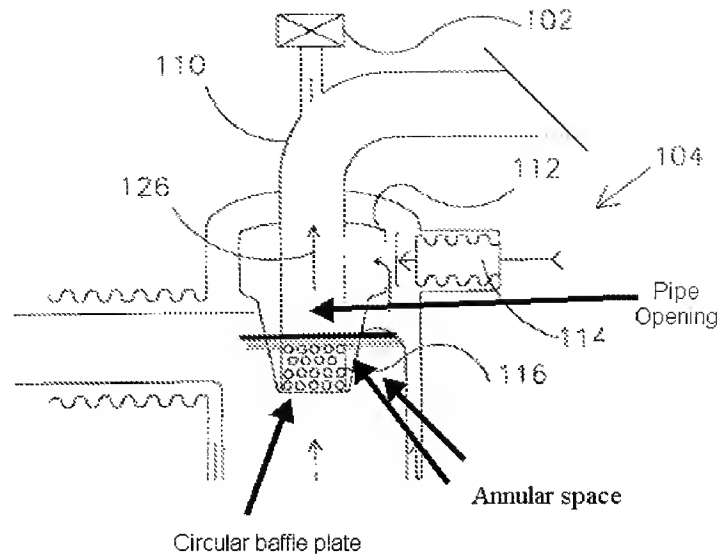
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Col. 3, lines 2-5), so that the combustion gas rises therein in a swirling manner causing fine ash particles to accumulate at a bottom of the secondary combustion chamber ('653: 36) ('653: Col. 6, lines 21-26).

20. '909 as combined with '653 and '165 fails to disclose a secondary combustion chamber that can be closed at the top by a cover. '149 teaches a combustion chamber (11) that is closed at the top by a cover (12). It would have been obvious for one skilled in the art at the time of invention to combine the gasifier of '909 as combined with '653 and '165 with the combustion chamber lid of '149 because such a combination would have produced the added benefit of a way to easily clean the inside of the combustion chamber to prevent ash build-up.

21. With regard to claim 5, '909 as combined with '165 further discloses a circular baffle plate is fitted below the opening of the pipe (see Fig. 6 reproduced in part below) in such a manner that a narrow annular opening ('165: 100) for the depositing of the fine ash particles between an outer wall ('165: 96) of the ash separator ('165: 16) and the baffle plate (centrifugal forces force ash to the outer portion of the separator (the annular space) while allowing clean gases to flow through the pipe).

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22. '909 as combined with '653 and '165 fails to disclose an ash separator that can be closed with a lid. '149 teaches a cylindrical vessel (11) that can be closed with a lid (12). It would have been obvious for one skilled in the art at the time of invention to combine the gasifier of '909 as combined with '653 and '165 with the cylindrical vessel lid of '149 because such a combination would have produced the added benefit of a way to easily clean the inside of the ash separator to prevent ash build-up.

23. With regard to claim 9, '909 as combined with '165 further discloses a substantially vertical pipe (184) is arranged centrally within the ash separator (16) (Figs. 1, 4 & 6), the pipe (184) having a lower opening (116). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the lower opening of the pipe approximately halfway up a height of the ash separator (16) (Fig. 6), since shifting the location of parts of a device involves only routine skill in the art.

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24. With regard to claims 11 & 13, '909 as combined with '653 and '165 discloses the claimed invention except for the secondary combustion chamber, the ash separator and the heat exchanger being connected in a framework to form a unitary structure. It would have been obvious at the time the invention was made to connect the secondary combustion chamber, the ash separator and the heat exchanger in a framework to form a unitary structure, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

25. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over '909 in view of '653, '165, '806 and '149.

26. '909 discloses a gasification boiler for solid fuels, the boiler comprising: a fuel and gasification chamber (20) closable by a filling door (35) (Col. 3, lines 1-5) and having air feeds (43) and depressions (32 in Fig. 1) for collecting and holding ash (Col. 5, lines 10-14), the depressions (32 in Fig. 1) disposed adjacent and parallel to a longitudinal grating (26) arranged at the bottom of the fuel and gasification chamber (20) and configured to allow coarse ash particles to combust and not enter a flow of combustion gas (Fig. 1; Col. 5, lines 4-10; ash is allowed to collect in the depressions and any combustible material remaining in the ash would continue to combust and the upper layers of fuel material would prevent the ash from entering the combustion gas flow; grate extends in a longitudinal direction and is parallel to the depressions).

27. '909 fails to disclose a combustion chamber situated below the grating and configured to receive and combust the combustion gas; a cylindrical secondary

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combustion chamber configured to further receive and combust the combustion gas connected at the bottom tangentially to an outlet of the combustion chamber so that the combustion gas rises therein in a swirling manner causing fine straw ash particles to accumulate at the bottom of the secondary combustion chamber; or a heat exchanger. '653 teaches a combustion chamber (35) situated below a grating (26) and configured to receive and combust the combustion gas (Fig. 1; Col. 6, lines 9-18); a cylindrical secondary combustion chamber (36) configured to further receive and combust the combustion gas connected at the bottom tangentially to an outlet of the combustion chamber (35) (Figs. 1 & 3; Col. 3, lines 2-5; Col. 6, lines 18-22, 35-37) so that the combustion gas rises therein in a swirling manner causing fine ash particles to accumulate at a bottom of the secondary combustion chamber (36) (Col. 6, lines 21-26); and a heat exchanger (Col. 7, lines 2-6). It would have been obvious for one skilled in the art at the time of invention to combine the gasifier of '909 with the syn-gas combustion chambers of '653 because such a combination would have produced the added benefit of a means for recovering energy from the syn-gas produced by the gasifier of '900 while reducing pollution by using a multi-stage combustion process.

28. '909 also fails to disclose a cylindrical ash separator for collecting ash particles located downstream from the secondary combustion chamber and having an inlet connected at the top tangentially to an outlet of the secondary combustion chamber to force the fine ash particles against an outer wall of the ash separator, the ash separator having a substantially vertical pipe arranged centrally therein, the pipe having a lower opening approximately halfway up a height of the ash separator; a circular baffle plate

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fitted below the opening of the pipe in the ash separator such that a narrow annular opening exists between the outer wall of the ash separator and the baffle plate to allow for the deposition of the fine ash particles at the bottom of the ash separator after it is pressed against the outer wall of the ash separator; and the ash separator having an outlet being connected to a heat exchanger. '165 teaches a cylindrical ash separator (16) for collecting ash particles located downstream from a combustion chamber (122) (Fig. 1) and having an inlet connected at the top tangentially to an outlet of the combustion chamber (122) (Fig. 1) to force the fine ash particles against an outer wall of the ash separator (16) (centrifugal forces force ash to the outer portion of the separator (the annular space), the ash separator having a substantially vertical pipe (184) arranged centrally therein (Figs. 1, 4 & 6), the pipe (184) having a lower opening (116) approximately halfway up a height of the ash separator (16) (Fig. 6); a circular baffle plate fitted below the opening of the pipe (184) in the ash separator (16) such that a narrow annular opening (100) exists between the outer wall (96) of the ash separator (16) and the baffle plate to allow for the deposition of the fine ash particles at the bottom of the ash separator (16) after it is pressed against the outer wall of the ash separator (see Fig. 6 reproduced in part above; centrifugal forces force ash to the outer portion of the separator (the annular space) while allowing clean gases to flow through the pipe); the ash separator (16) having an outlet (110) being connected to a heat exchanger (19) (Fig. 1; Col. 7, lines 6-8; applicant has also previously admitted that using heat exchangers to recover energy from exhaust gases is well-known). It would have been obvious for one skilled in the art at the time of invention to combine the gasifier of '909

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with the ash separator of '165 because such a combination would have produced the added benefit of a means for reducing particulate matter in the exhaust gas to reduce particulate pollution when the gas is exhausted into the environment.

29. '909 fails to explicitly disclose the gasification boiler burning bales of straw, the gasification chamber configured to receive a bale of straw, although '909 does disclose generally that solid biomass is burned. '806 explicitly states that almost all kinds of biomass, including straw, can be gasified and burned (Col. 1, lines 28-32). It is well-known that straw is typically transported and stored in the form of bales. It would have been obvious to one having ordinary skill in the art at the time of invention to combine the biomass gasification reactor of '909 with the straw fuel of '806 because such a combination would have produced the added benefit of a means for recovering energy from straw. Furthermore, the reactor of '909 is presently capable of burning entire bales of straw since the reactor has dimensions far greater than that of a typical bale of straw.

### ***Conclusion***

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 4,637,327 to Jorgensen (discloses combusting entire bales of hay).

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID J. LAUX whose telephone number is (571)270-7619. The examiner can normally be reached on M-F 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Rinehart can be reached on (571) 272-4881. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. J. L./  
Examiner, Art Unit 3743

October 06, 2011

/Kenneth B Rinehart/  
Supervisory Patent Examiner, Art Unit 3743